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COLLECTING CONTESTS AS A MEANS OF INCREASING STUDENT INTEREST IN BIOLOGICAL SUBJECTS

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For some twenty years the author has been organizing contests among his students in Botany, Zoology, Bird Study, Tree Study and Entomology as a means of encouraging a greater interest in field work with better observation and more intelligent understanding. Some of the schemes employed may at first glance seem childish. That the plan gets results is attested by the working knowledge of plants and animals acquired by these students and what they have been able to do with this knowledge as teachers, research workers and in other fields since leaving college.

In almost every case these contests represent overtime work and are wholly voluntary with the student. Successful ranking in the contests, however, carries definite additions to the grade otherwise earned. It is not our purpose to discuss the good or bad pedagogy of such an incentive but rather to explain how the contests are organized and tell something of the results obtained.

THE SPRING PLANT CONTEST

This contest has for its special equipment a record sheet and a set of rules, both posted on the bulletin board in the general botany laboratory; and two jars with fresh water, one "for today's flowers," the other for "flowers brought previous to today."

The record sheet is ruled in vertical columns. The first column numbers the horizontal lines, the other columns are — from left to right "scientific name of plant," "common name of plant," "first collector's name," "date collected," "second collector," "date," "third collector," "date." All species of seed bearing plants both native and cultivated that have come into bloom in open ground out of doors, having been out throughout the winter or raised from seed in open ground out of doors, are eligible for entry. The student must bring a flower in full bloom as evidence. This is left in the jar. He then records the correct scientific and common name on the record and writes his name and date in the "first Collector" column. Each plant so recorded gives him five points. The next person to bring a flower of this same plant puts it in the jar and

records his name and the date in the second column for three points. The third collector receives two points. We name the specimens for the students, if they wish, but the students soon learn to use the manuals and herbarium and name most of their own specimens rather than wait for help, running the chance of being beaten by a competitor. Recording the wrong name, duplicating entries, and other mistakes carry loss of points for the student at fault to reduce carelessness.

Participation in the contest is wholly voluntary and is done outside of class and laboratory time. Sixty to seventy percent of the botany students usually take a rather active part in the contest. All members of the class are urged to look the specimens and the list over from time to time and frequent references are made to the contest in class and laboratory. The largest number of species recorded by May 29th any spring was 402 in 1929. The average for fifteen years is 287. Each year some of the students learn to recognize and name practically all the flowers brought in.

The record sheets at the end of the contest are added to those of previous years in a loose leaf binder so that now we have a phenological record of practically all of the spring flowering plants for our region for a period of seventeen years.

The students having the largest totals of points at the end of the semester have definite additions made to the grade otherwise earned. The contest has become traditional and the honor of winning seems to be the greater incentive in many cases.

The contest once started runs along pretty much automatically except that help is given in naming plants when asked for, the list is watched closely for mistakes and irregularities, and the specimen jars are cleaned up and rearranged daily. The original plan, which evolution has changed somewhat from year to year, came from that excellent teacher and friend of young folks, Miss Edna S. Gamble of Shenandoah, Iowa.

Various types of plant contests have been used with apparently good success during the summer and in the fall.

THE BIRD CONTEST

Birds seen are signed for as on the plant record. The first observer of each species gets three points, the second observer two point and those in the last column one point. No evidence of having seen the bird is required. This is a weak feature, of course, as some are more credulous than others in their identifications. Field trips with the class are conducted weekly. The first student to

point out and correctly name each species of bird not previously pointed out during the season gets ten points and the first nest of each species so pointed out earns five points. The larger points given for these verified identifications are designed to equalize any inaccuracies of the self-recording chart. Considerable time is given early in the course to the identification of birds from pictures and museum specimens which greatly facilitates their identification in the field.

The Zoology Contest

Insect collecting receives the major emphasis in the outdoor work in the general zoology class, although other groups come in for attention from time to time. For the fall a collection of forty specimens of not less than 25 species of insects correctly and neatly mounted and labeled is required. A few field trips are taken on laboratory days to give instructions and bring up this requirement. These collections are used for some classification work later in the semester. No group lends itself more readily than the insects for illustrating taxonomic methods.

A voluntary contest in which ten points each is given for the first two specimens of each species of insect to be turned in sends a good percentage of the students on frequent outdoor trips and makes them more observant of all life about them. These contest insects are carefully pinned and given correct locality labels but are not identified. The students leave their specimens at any time and in any number they wish pinned in the bottom of a cigar box. These boxes are uniformly labeled with the student's name and are left on edge on a designated shelf in the laboratory. The order in which they appear on the shelf determines which was turned in first. The first two specimens of each species in acceptable condition is taken from the boxes and the points recorded on a sheet where all may know how the contest stands at any time. Further specimens of the rarer insects may be taken at a reduced number of points if desired. The boxes containing poorly mounted specimens and the duplicates are then put on the return shelf for their owners. These returned duplicates, if in good condition, may be used in the required collection. Points are given on the required collection for each species and each order represented.

A small collection is required again in the spring. This is in a special insect group selected by the student from a suggested list. The turning in of contest insects for points is continued as in the fall.

Other points are offered from time to time throughout the year for seasonable material. The first salamander, frog and toad eggs have been favorites. Snakes, hydra, protozoa, etc., lend themselves nicely to the purpose and are useful in class and laboratory. The possibilities are as broad as the zoological field and all will agree that these first-hand observations in the animal's natural habitat very acceptably supplement the required indoor work.

To the uninitiated the total number of species of insects secured in the contest collection is amazing as they run well into the hundreds each time. In a recent summer school class in Entomology — giving four semester credits, half of which was devoted to class work and the major part of the laboratory time being given to work in insect morphology, eleven students turned in over 900 species of insects besides each making a large personal collection named to family and species.

The large number of specimens thus secured, furnish work for the students in systematic entomology. Many of the specimens, some of which are new for the state and occasional ones new to science, are incorporated into the collection being made as a basis for a survey of Iowa insects.

The "Iowa survey collection" is mounted in white cardboard trays, a separate tray for each species of insect. Each specimen bears a name label below its locality label on which is lettered the scientific name, authority and catalog number of the species. The name of the person making the determination appears on either the front or the back of this name label. Each tray bears in its upper left corner a somewhat larger label also lettered with the scientific name and catalog number of the insects. The trays are arranged in their logical order (according to the catalog number) in glass topped cases.

Insect orders are numbered in Roman notation and the families in Arabic numerals. These numbers appear on the family markers in the cases. Any insect may then be designated by numbers alone, e.g., XI 102 15648 is the Colorado potato beetle; XXII 71 528-1 the common house fly; and XXI 16 1090 the corn ear worm.

Efforts are made to secure as many species as possible from different parts of the state and at all seasons of the year. Some of the college biologists have given good help and many high school teachers of biology are coöperating. Index cards as here shown are used to record the geographic and seasonal distribution of the specimens. These cards are also marked for the literature on Iowa

insects. This card index shows what insects are known to occur in Iowa and when and where they have been found.

Special mention is given students who find insects not previously reported for Iowa or in parts of Iowa not heretofore reported.

The success of contests as here described will depend a great deal on the temperament of the one having charge of them. They are designed to be pretty much automatic but require some "talking up" to get the best results.

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